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EXAMINER

FETZNER, TIFFANY A

ART UNIT	PAPER NUMBER
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2859

DATE MAILED: 04/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
10/003,837

Applicant(s)
Peck et al.,

Examiner
Tiffany Fetzner

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Dec 3, 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-55 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on Jun 6, 2002 is/are a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 6) ☐ Other:

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DETAILED ACTION

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2.

Specification

3. The incorporation of essential material in the specification by reference to a foreign application or patent, or to a publication is improper. Applicant is required to amend the disclosure to include the material incorporated by reference. The amendment must be accompanied by an affidavit or declaration executed by the applicant, or a practitioner representing the applicant, stating that the amendatory material consists of the same material incorporated by reference in the referencing application. See *In re Hawkins*, 486 F.2d 569, 179 USPQ 157 (CCPA 1973); *In re Hawkins*, 486 F.2d 579, 179 USPQ 163 (CCPA 1973); and *In re Hawkins*, 486 F.2d 577, 179 USPQ 167 (CCPA 1973).

4. The examiner notes that only non-essential material from issued US patents may be incorporated by reference, the incorporation by reference of Journal articles, and non-issued US applications is not permissible in US patent applications and must be removed from applicant's disclosure.

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- A) On page 3 paragraph 2 **delete** the last line, "which are also incorporated herein by reference in its entirety for all purposes."
- B) On page 4 paragraph 1 **delete** the phrase, "incorporated herein by reference in its entirety for all purposes", from lines 1 and 2.
- C) On page 5 paragraph 2, **indent** the word "small" so that the new paragraph is more clearly visible **and delete** the phrase, "the entire disclosure of which is incorporated herein by reference in its entirety for all purposes", from lines 3 and 4.
- D) On page 24 paragraph 2, line 6 **delete** the phrase, "and incorporated herein by reference for all purposes".
- E) On page 26 paragraph 1, **indent** the word "The" so that the new paragraph is more clearly visible **and delete** the phrase, "the entire disclosure of which is incorporated herein by reference in its entirety for all purposes", from lines 4 and 5.

5. The disclosure is objected to because of the following informalities:

- A) The examiner notes that in applicant's specification all new paragraphs should either be indicated by a blank line between paragraphs, with the text left justified, or all of applicant's paragraphs should have a the first word of the first sentence indented; in order to ensure easy readability of applicant's disclosure. Appropriate correction is required.
- B) Regarding applicant's disclosure, the phrases "for example", "such as", and "or the like" raise the issue of indefiniteness in applicant's description under 35 USC 112 second paragraph because it is unclear whether the limitation(s) following the phrase are part of the applicant's invention, and under 35 U.S.C. 112, second paragraph, applicant's disclosure must "particularly

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point out and describe the subject matter which applicant regards as the invention. The examiner would recommend simply deleting the phrase "for example" from all occurrences within the specification as a means of overcoming this objection.

- B1) Delete "for example" on page 2 paragraph 1 line 3.**
- B2) Delete "for example" on page 3 paragraph 1 line 1.**
- B3) Delete "for example" on page 4 paragraph 2 line 2.**
- B4) Delete "for example" on page 5 paragraph 1 line 1.**
- B5) Delete "for example" on page 11 paragraph 1 three line from the bottom of paragraph 3.**
- B6) Delete "for" on page 11 paragraph 1 at the end of the last line.**
- B7) Delete "example" on page 12 paragraph 1 line 1, at the beginning of the first line.**
- B8) Delete "for example" on page 14 paragraph 1 line 3.**
- B9) Delete "for example" on page 14 paragraph 1 line 7.**
- B10) Delete "for example" on page 17 paragraph 1 line 3.**
- B11) Delete "for example" on page 17 paragraph 3 line 4.**
- B12) Delete "for example" on page 18 paragraph 2 line 4.**
- B13) Delete ". Examples" on page 18 paragraph 3 line 1 and insert "which".**
- B14) Delete ". Examples" on page 19 paragraph 2 line 3 and insert "which".**
- B15) Delete ". Examples" on page 19 paragraph 3 line 4 and insert "which".**
- B16) Delete ". Examples" on page 19 paragraph 3 line 6 and insert "which".**
- B17) Delete "or the like" on page 20 paragraph 1 line 9.**

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B18) Delete “example of an” on page 20 paragraph 1 line 9.

B19) Delete “Examples of cross-sectional” on page 20 paragraph 3 line 2 and **insert** “Cross-sectional”.

B19) Delete “For example, in an” on page 22 paragraph 1 line 6 and **insert** “An”.

B20) Delete the second “for” on page 24 paragraph 3 line 4.

B21) Delete “example” on page 24 paragraph 3 line 5.

B22) Delete “For example, in” and **insert** “In” on page 26 paragraph 2 line 6.

B23) Delete “for example” on page 27 paragraph 2 line 3.

B24) Delete the “for” on page 27 paragraph 3 line 2.

B25) Delete “example” on page 27 paragraph 3 line 3.

B26) Delete “for example,” on page 28 paragraph 2 line 3.

B27) Delete “In another example” on page 28 paragraph 2 line 4 and **insert** “Alternatively”.

B28) Delete “Examples of such” on page 30 paragraph 1 line 6 and **insert** “Capillary-LC/micro-NMR”.

B29) Delete “for example,” on page 32 paragraph 1 line 2.

B30) Delete “. Examples, cor instance, include” on page 32 paragraph 1 lines 4-5, and **insert** “, including”.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459

(1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. **Claims 1-37 and 40-55** are rejected under **35 U.S.C. 103(a)** as being unpatentable over

Freedman et al., US patent 6,194,900 B1 issued February 27th 2001.

9. With respect to NMR system **Claim 1**, and corresponding NMR probe **claim 18**,

Freedman et al., teaches, shows, and suggests "An NMR system comprising, in combination: an NMR probe" [See abstract] "comprising multiple NMR" apertures and fluid inlet ports that allow a sample to be delivered into the NMR micro channel micro column device. [See col. 29 lines 38 through col. 37 line 45; col. 27 line 45 through col. 28 line 57].

10. **Freedman et al.**, lacks directly teaching the terms "detection site" or "sample holding void" However, It would have been obvious to one of ordinary skill in the art, at the time that the invention was made that the teachings and figures of the **Freedman et al.**, reference contain structures suggest features that read on these limitations because moveable manifold 306 which is initially taught in col. 28 starting in line 40 through col. 37 line 54, rotates between selected aperture positions, of separate inlet ports, and depending on the selected position allows a fluid to

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enter the device at that point, and directs the fluid samples into a separation compartment, that is serially connected to a microcoil, therefore each aperture is a site or point, in fluid communication with a microcoil from which detection of a signal from a sample to be analyzed can be obtained. [See also col. 28 50-56] Therefore, the apertures and inlet ports suggest initial sites from which detected signals are acquired, and because a sample is held in the apertures until analysis is performed, each of these sites is also suggestive of a "sample holding void", it would have been obvious to one of ordinary skill in the art, at the time that the invention was made that applicant's terminology is suggested by the teachings of the **Freedman et al.**, reference. [See col. 28 starting in line 40 through col. 37 line 54].

11. Additionally, **Freedman et al.**, teaches that the integrated NMR probe has "an associated NMR microcoil" [See component 632 in Figures 26a, 26B; component 514A, and 514B in Figures 24A, 24B] "and a controllable fluid router" (i.e. interpreted as rotor 622 in Figures 26B, 26D) "operative to direct fluid sample to the multiple NMR detection Sites." [See **Freedman et al.**, col. 29 line 11 through col. 37 line 54; Figures 18 through 26D].

12. With respect to **Claim 2**, **Freedman et al.**, shows and teaches that "the multiple NMR sites are integrated in a probe module." [See **Freedman et al.** Figures 15 through 26D; col. 27 line 36 through col. 37 line 54; abstract,] The same reasons for rejection, obviousness, and motivation to combine that apply to **claim 1** also apply to **claim 2**.

13. With respect to **Claim 3**, and corresponding **claim 22**, which depends from **claim 21**, **Freedman et al.**, shows and teaches that "the sample holding void of each of the NMR detection sites" in the prior art of Sweedler et al., is limited to the analysis of simple aqueous solutions, and

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includes a capillary channel etched or grooved in a substrate such as glass or polycarbonate and includes a planar lithographic microcoil. [See **Freedman et al.**, col. 4 lines 10-28] This suggests that the use of a capillary-scale fluid channel in an NMR probe module", is already well-known in the prior art. Additionally, **Freedman et al.**, teaches that Sweedler et al., lacks describing or suggesting a micron device with integrated sample preparation and detection; as well as the use of "a capillary-scale fluid channel" [See 23 lines 25-38;] in the current invention. Therefore, **Freedman et al.**, teaches that in the **Freedman et al.**, invention "the sample holding void of each of the NMR detection sites is in a capillary/micron -scale fluid channel in the module." [See **Freedman et al.**, col. 23 lines 25-38; col. 4 lines 10-28; Figures 10, 11 13, 15, 17, 19a through 19c, 20, 15] The same reasons for rejection, obviousness, and motivation to combine, that apply to **claims 1, 2**, apply to **claim 3**, and the same reasons for rejection, obviousness, and motivation to combine, that apply to **claims 1, 5, 7, 18, 20, and 21** also apply to **claim 22**.

14. With respect to **Claim 4**, and corresponding **claim 23**, which depends from **claim 21**, **Freedman et al.**, shows and teaches that "The sample holding void of each of the NMR detection sites is in a micro-scale fluid channel in the module." [See **Freedman et al.**, col. 4 lines 10-28; col. 20 lines 36 through col. 21 line 7; Figures 10, 11 13, 15, 17, 19a through 19c, 20, 15] The same reasons for rejection, obviousness, and motivation to combine, that apply to **claims 1, 2, 3**, apply to **claim 4**, and the same reasons for rejection, obviousness, and motivation to combine, that apply to **claims 1, 5, 7, 18, 20, and 21** also apply to **claim 23**. The same reasons for rejection, obviousness, and motivation to combine, that apply to **claims 1, 2, 3** also apply to **claim 4**.

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15. With respect to **Claim 5, Freedman et al.**, shows and teaches that “The controllable fluid router is operative in response to an electrical input signal.” [See col. 28 lines 40-47 where the routing manifold device 306 applies an electric potential to the fluid in the manifold aperture, inlet ports, and col. 29 line 38 through col. 32 line 32, where the rotor manifolds rotation about the stator to switch between different aperture positions, is explained in detail, col. 18 lines 36-63 in general.] The same reasons for rejection, obviousness, and motivation to combine that apply to **claim 1** also apply to **claim 5**.

16. With respect to **Claim 6, Freedman et al.**, shows and teaches that “the controllable fluid router is operative to direct fluid sample to any selected ones of the NMR detection sites.” [See col. 29 line 38 through col. 32 line 32, where the manifolds rotation about the stator to switch between different aperture positions, is explained in detail, col. 37 lines 16-54; and col. 18 lines 36-63 in general.] The same reasons for rejection, obviousness, and motivation to combine that apply to **claim 1** also apply to **claim 6**.

17. With respect to **Claim 7, Freedman et al.**, shows and teaches that “the controllable fluid router is operative to direct fluid sample to any selected ones of the NMR detection sites corresponding to the “input signal.” [See col. 28 lines 40-47; where the use of specific electric potential to change aperture positions suggests that directing “fluid sample to any selected ones of the NMR detection sites” corresponds to the ‘input signal’.”] The same reasons for rejection, obviousness, and motivation to combine that apply to **claim 1** also apply to **claim 7**.

18. With respect to **Claim 8, Freedman et al.**, shows and teaches that “an operative component in communication with the router and operative to generate the Input signal to the

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router.” [See col. 28 line 40 through col. 37 line 54]: The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 7** also apply to **claim 8**.

19. With respect to **Claim 9, Freedman et al.**, suggests, shows and teaches that “the multiple NMR sites and the operative component are integrated in a probe module.” [See abstract, Figures 1 through 26D; col. 28 line 40 through col. 37 line 54; col. 18 line 36 through col. 19 line 3; and the entire reference in general, since an integrated NMR probe device is a main goal of the **Freedman et al.**, reference. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 7, 8** also apply to **claim 9**.

20. With respect to **Claim 10, Freedman et al.**, suggests, and teaches that “a controller unit in communication with the router and operative to generate the input signal to the router” [See col. 18 lines 36-57; col. 29 line 41 through col. 31 line 49]. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 7** also apply to **claim 10**.

21. With respect to **Claim 11, Freedman et al.**, suggests, and teaches that “the multiple NMR sites and the controller unit are integrated in a probe module.” [See Figures 15 through 26D; col. 18 lines 36-57; and col. 29 line 41 through col. 31 line 49]. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 7, 10** also apply to **claim 11**.

22. With respect to **Claim 12, Freedman et al.**, suggests, “a controller unit operative to receive information from any of the multiple NMR detection sites and to generate the input signal to the router based at least in part on said information.” [See col. 29 lines 38-53 with col. 30 line 48 through col. 31 line 49 and col. 32 lines 52-68 which suggest manual or electronic or hardware

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control of the changing rotor manifold positions.] The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5** also apply to **claim 12**.

23. With respect to **Claim 13, Freedman et al.**, suggests, “an operative component and a controller unit operative to receive information from the operative component and to generate the input signal to the router based at least in part on said information.” [See the moveable manifolds, the rotor, stator, and the taught electronic hardware, taught in these teachings, (i.e. col. 18 line 36 through col. 19 line 3; col. 29 lines 38-53 with col. 30 line 48 through col. 31 line 49 and col. 32 lines 52-68 which suggest manual or electronic or hardware control for changing rotor manifold positions.)] The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5, 12** also apply to **claim 13**.

24. With respect to **Claim 14, Freedman et al.**, suggests, and shows “the operative component, the controller unit and the multiple NMR sites are integrated in a probe module.” [See Figures 18 through 26D; especially Figure 25 and the entire text in general.] The same reasons for rejection, obviousness, and motivation to combine, that apply to **claims 1, 5, 12, 13** also apply to **claim 14**.

25. With respect to **Claim 15, Freedman et al.**, suggests, and shows “one or more of the multiple NMR detection sites are in communication with a data processing unit.” [See col. 35 line col. 25 lines 9-42; col. 35 lines 22-42.] The same reasons for rejection, obviousness, and motivation to combine that apply to **claim 1** also apply to **claim 15**.

26. With respect to **Claim 16, Freedman et al.**, teaches “the data processing unit is integrated in a probe module.” [See col. 34 line 65 through col. 35 line 42; Figure 25] The same

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reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 15** also apply to **claim 16**.

27. With respect to **Claim 17, Freedman et al.**, suggests, “the data processing unit provides an input signal to the controllable router”. [See col. 18 line 36 through col. 19 line 3; col. 29 lines 38-53 with col. 30 line 48 through col. 31 line 49 and col. 32 lines 52-68 which suggest manual or electronic or hardware input control for changing rotor manifold positions.] The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 15** also apply to **claim 17**.

28. With respect to **Claim 19**, this claim is just an independent version of **claims 1, 5, and 10, therefore**, the same reasons for rejection, obviousness, and motivation to combine as those already given in the rejection of **claims 1, 5, 7, and 10**, apply to **claim 19**, and need not be reiterated.

29. With respect to **Claim 20, Freedman et al.**, teaches, shows and suggests “A NMR probe module comprising: at least one fluid inlet port, operative to receive a fluid sample, [See Figures 15 through 26D and fluid inlet port 202] “a fluid pathway comprising multiple channels in fluid communication with the at least one fluid inlet port for the transport of fluid sample to be tested;” [See Figures 16, 17 col. 31 line 50 though col. 32 line 32] **Freedman et al.**, teaches, shows and suggests the limitations of “multiple NMR detection sites, each in fluid communication with at least one of the multiple channels, each comprising: a sample holding void, and an associated NMR microcoil; and a controllable fluid router operative to direct fluid sample in the module to at least a selected one of the multiple channels”, for the same reasons as those previously given with

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respect to **claims 1, and 18** therefore The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 18** also apply to **claim 20** and need not be reiterated.

30. With respect to **Claim 21, Freedman et al.**, teaches, shows and suggests “the controllable fluid router is operative in response to an electrical input signal to direct fluid sample in the module to at least a selected one of the multiple channels corresponding to the input signal”, because this limitation is just a combination of claims 5 and 7, therefore the same reasons for rejection, obviousness, and motivation to combine as those previously given with respect to **claims 1, 5, 7, 18, and 20**, also apply to **claim 21** and need not be reiterated.

31. With respect to **Claim 21, Freedman et al.**, teaches, shows and suggests “an outlet port in fluid communication with the fluid pathway.” [See col. 36 lines 36-54 outlet port 630] The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5, 7, 18, and 20**, also apply to **claim 24** and need not be reiterated.

32. With respect to **Claim 25, Freedman et al.**, teaches, shows and suggests “each multiple NMR detection site is optimized for different nuclear species.” [See col. 10 line 66 through col. 11 line 10] The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 18, 20** also apply to **claim 25** and need not be reiterated.

33. With respect to **Claim 26, Freedman et al.**, lacks directly teaching that “at least one of the multiple NMR detection sites is optimized for 1 dimensional NMR study,” however **Freedman et al.**, teaches that multinuclear NMR spectra are obtained from the **Freedman et al.**, invention, [See col. 6 lines 30-39], therefore the teaching reads on one or more dimensions of NMR spectra, because the teaching broadly includes all the various types of spectral results.

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Therefore, it would have been obvious to one of ordinary skill in the art, at the time that the invention was made that modifying the scope of the **Freedman et al.**, reference to optimize for a 1 dimensional NMR study falls within the scope of the **Freedman et al.**, reference. The same reasons for rejection, obviousness, and motivation to combine, that apply to **claims 1, 18, 20** also apply to **claim 26** and need not be reiterated.

34. With respect to **Claim 27, Freedman et al.**, lacks directly teaching that “at least one of the multiple NMR detection sites is optimized for 2 dimensional NMR study.” However, **Freedman et al.**, teaches that NMR is a known powerful analytical tool for providing molecular structure information, in two and three dimensions that is spectral information. [See col. 1 line 66 through col. 2 line 9] **Freedman et al.**, also teaches that multinuclear NMR spectra are obtained from the **Freedman et al.**, invention, [See col. 6 lines 30-39], therefore the teaching reads on one or more dimensions of NMR spectra, being acquired and displayed because the teaching broadly includes all the various types of spectral results. Therefore, it would have been obvious to one of ordinary skill in the art, at the time that the invention was made that modifying the scope of the **Freedman et al.**, reference to optimize for a 2 dimensional NMR study falls within the scope of the **Freedman et al.**, reference. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 18, 20** also apply to **claim 27** and need not be reiterated.

35. With respect to **Claim 28, Freedman et al.**, lacks directly teaching that “the multiple NMR detection sites are optimized for different sample sizes.” however, **Freedman et al.**, signal to noise is maximized by decreasing the coil radius, and matching the coil inner diameter as close to the size of the sample as possible. [See col. 2 lines 51-53] This teaching suggests to an

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individual of ordinary skill in the art that in using the **Freedman et al.**, invention that the detection site for each microchannel aperture with give a large signal to noise ration if the inner diameter of the aperture matches the size of the sample, and since a large signal to noise ratio is known in the art to be highly beneficial because it indicates that signals are easily distinguishable from noise. It would have been obvious to one of ordinary skill in the art, at the time that the invention was made that the teachings of the **Freedman et al.**, reference suggest an optimization for sample size, to an individual of ordinary skill in the art. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 18, 20** also apply to **claim 28** and need not be reiterated.

36. With respect to **Claim 29, Freedman et al.**, lacks directly teaching that “the multiple NMR detection sites are optimized using different materials.” However, the ability to construct the different aperture sites from different materials is taught in col. 19 line 36 through col. 20 line 24] and it would have been obvious to one of ordinary skill in the art, at the time that the invention was made that since the intrinsic properties of a material, determine the types of samples, for which a particular material produces a strong signal that an individual of ordinary skill in the art would automatically select a material for the detection site dependent upon the type of sample to be analyzed. Therefore, this claim is an obvious modification of the teachings of the **Freedman et al.**, reference, and the application of conventional principles within the NMR art that an individual of ordinary skill in the art would already have been aware of at the time that the invention was made. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 18, 20** also apply to **claim 29** and need not be reiterated.

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37. With respect to **Claim 30, Freedman et al.**, lacks directly teaching that “the multiple NMR detection sites are made of fused silica and PEEK” However, **Freedman et al.**, teaches that the transparent sheets which just cover and seal the detection apertures may be a polyimide substate such as fused silica, quartz diamond sapphire or any other material which enables light transmission therethrough therefore, It would have been obvious to one of ordinary skill in the art, at the time that the invention was made, that the applicant’s claim that “the multiple NMR detection sites are made of fused silica and PEEK” are suggested from the teachings of **Freedman et al.**, in col. 19 line 36 through col. 20 line 9. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 18, 20** also apply to **claim 30** and need not be reiterated.

38. With respect to **Claim 31, Freedman et al.**, lacks directly teaching that “the multiple NMR detection sites are made of fused silica and polytetrafluoroethylene.” However, **Freedman et al.**, teaches that the transparent sheets which just cover and seal the detection apertures may be a polyimide substate such as fused silica, quartz diamond sapphire or any other material which enables light transmission therethrough therefore, It would have been obvious to one of ordinary skill in the art, at the time that the invention was made, that the applicant’s claim that “the multiple NMR detection sites are made of fused silica and polytetrafluoroethylene” are suggested from the teachings of **Freedman et al.**, in col. 19 line 36 through col. 20 line 9. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 18, 20** also apply to **claim 31** and need not be reiterated.

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39. With respect to **Claim 32, Freedman et al.**, suggests that “each of the multiple NMR detection sites are optimized differently” [See col. 34 lines 51-64; col. 3 lines 26-51; table 1]. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 18, 20** also apply to **claim 32** and need not be reiterated.”

40. With respect to **Claim 33, Freedman et al.**, teaches and shows that “the microcoil is helical, solenoidal or spiral.” [See Figures 25, 26a, 26b, 24a, 24b; col. 2 lines 64-68] The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 18, 20** also apply to **claim 33** and need not be reiterated.

41. With respect to **Claim 34, Freedman et al.**, teaches and suggests that “the microcoil is planar” [See col. 4 lines 16-18; col. 36 lines 25-30]. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 18, 20** also apply to **claim 34** and need not be reiterated.

42. With respect to **Claim 35, Freedman et al.**, teaches and suggests “an analyte extraction chamber in fluid communication with at least one of the NMR detection sites.” [See col. 36 lines 31-54 Figures 26a and 26b]. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 18, 20** also apply to **claim 35** and need not be reiterated.

43. With respect to **Claim 36, Freedman et al.**, teaches and suggests “the analyte extraction chamber is operative to perform liquid chromatography. [See col. 1 lines 40-53; col. 1 line 66 through col. 2 line 14; col. 2 lines 43-50; col. 6 lines 1-15; col. 36 lines 31-54 Figures 26a and 26b;]. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 18, 20, 35** also apply to **claim 36** and need not be reiterated.

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44. With respect to **Claim 37, Freedman et al.**, teaches and suggests “the analyte extraction chamber is operative to perform capillary electrophoresis.” [See col. 1 lines 40-53; col. 1 line 66 through col. 2 line 14; col. 2 lines 43-50; col. 6 lines 1-15; col. 36 lines 31-54 Figures 26a and 26b]. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 18, 20, 35** also apply to **claim 37** and need not be reiterated.

45. With respect to **Claim 40, Freedman et al.**, teaches and suggests “at least one operative component in communication with the fluid pathway.” [See col. 36 lines 36-54 outlet port 630] The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5, 7, 18, 20, and 35**, also apply to **claim 40** and need not be reiterated.

46. With respect to **Claim 41, Freedman et al.**, teaches and suggests “the operative component is a heating device” [See the laser used for the laser ablation process, in col. 13 line 50 through col. 14 line 22; col. 34 lines 51-64]. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5, 7, 18, 20, 35, and 40**, also apply to **claim 41** and need not be reiterated.

47. With respect to **Claims 42, 43, and 44, Freedman et al.**, lacks directly teaching that “the operative component is a sonication device”, “a reaction site” or “an electrical communication with the controllable gate” However **Freedman et al.**, uses his device to sample biological samples, with the processing controlled electronically by a computer, therefore “an electrical communication with the controllable gate” is necessarily within the scope of the reference” and the teaching of col. 37 line 55 through col. 38 line 40 suggest the presence of “reaction sites” inside the device” Additionally, because the rotor is capable of rotating about the stator, [See col.

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29 lines 41-53; It would have been obvious to one of ordinary skill in the art, at the time that the invention was made that the rotation produces a sound therefore, the rotor acts as a sound producing or sonication device, in the course of processing samples in the **Freedman et al.**, device, therefore “a sonication device”, “a reaction site” or “an electrical communication with the controllable gate” are components suggested to be within the **Freedman et al.**, device. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5, 7, 18, 20, 35, and 40**, also apply to **claims 42, 43, and 44** and need not be reiterated.

48. With respect to **Claim 45, Freedman et al.**, Shows and suggests “the operative component is in communication with the one or more of the NMR detector sites. [See Figures 1 through 26D] The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5, 7, 18, 20, 35, and 40**, also apply to **claim 45** and need not be reiterated.

49. With respect to **Claim 46, Freedman et al.**, teaches and suggests “the operative component is an IR detector” [See col. 11 lines 45-49; col. 34 line 65 through col. 65 line 21] The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5, 7, 18, 20, 35, and 40**, also apply to **claim 46** and need not be reiterated.

50. With respect to **Claim 47, Freedman et al.**, suggests that an “operative component is a photo diode array” because the use of laser ablation photo-dissociates the chemical bonds, which are subsequently ejected and **therefore, Freedman et al.**, knows and determines the amount of light incident on a sample. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5, 7, 18, 20, 35, and 40**, also apply to **claim 47** and need not be reiterated.

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51. With respect to **Claim 48, Freedman et al.**, teaches and suggests “the operative component is a U-V visibility array. [See col. 11 lines 45-49; col. 13 lines 37-65; col. 34 line 65 through col. 65 line 21]. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5, 7, 18, 20, 35, and 40**, also apply to **claim 48** and need not be reiterated.

52. With respect to **Claim 49, Freedman et al.**, teaches and suggests “the operative component is a micro controller.” [See col. 35 lines 43-56 where microcoil 516A is hyphenated into a micro magnet, with all the operational controlling circuitry as aspects of the integrated invention] The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5, 7, 18, 20, 35, and 40**, also apply to **claim 48** and need not be reiterated.

53. With respect to **Claim 50, Freedman et al.**, lacks directly teaching “a memory module”, however **Freedman et al.**, teaches and suggests that central computer 556 controls data acquisition, signal storage, and signal processing, and because memory is a location for data storage in a computer, It would have been obvious to one of ordinary skill in the art, at the time that the invention was made that the central computer 556 taught by **Freedman et al.**, must necessarily have a memory device or module that communicates with the inventive integrated microcoil device. [See col. 35 lines 26-42, Figure 25] The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5, 7, 18, 20, 35, and 40**, also apply to **claim 50** and need not be reiterated.

54. With respect to **Claim 51, Freedman et al.**, teaches and suggests “the operative component is in communication with a data processing unit,” for the same reasons as those given in the rejection of **claim 15**, that need not be reiterated, therefore The same reasons for rejection,

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obviousness, and motivation to combine that apply to **claims 1, 5, 7, 15, 18, 20, 35, and 40**, also apply to **claim 53** and need not be reiterated.

55. With respect to **Claim 52, Freedman et al.**, teaches and suggests “the operative component is in communication with a controller unit” for the same reasons as those given in the rejection of **claim 7**, that need not be reiterated, therefore the same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5, 7, 18, 20, 35, and 40**, also apply to **claim 53** and need not be reiterated.

56. With respect to **Claim 53, Freedman et al.**, teaches and suggests “the operative component is a pump.” [See col. 37 lines 16-23 where the ability to pump a sample through the chamber is taught.] The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5, 7, 18, 20, 35, and 40**, also apply to **claim 53** and need not be reiterated.

57. With respect to **Claim 54, Freedman et al.**, teaches and suggests “An NMR probe module comprising: at least one fluid inlet port, operative to receive a fluid sample; a fluid pathway comprising multiple channels in fluid communication with the at least one fluid inlet port, for the transport of fluid sample to be tested; and multiple NMR detection cells, each in fluid communication with a corresponding one of the multiple channels” for the same reasons as those already given in the rejection of claim 20, which need not be reiterated. Additionally, **Freedman et al.**, shows suggests “an enlarged void for holding a fluid sample, and an associated NMR microcoil”, from Prior art figure 3, and enlarged preparation chambers 530A and 532A”. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5, 7, 18, and 20**, also apply to **claim 54** and need not be reiterated.

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58. With respect to **Claim 55, Freedman et al.**, teaches and suggests “a controllable fluid router operative to direct fluid sample in the module to selected ones of the multiple channels”, for the same reasons as those given with respect to claims 1, 18, 19, 20, and 54, therefore the same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5, 7, 18, 19, 20, and 54**, also apply to **claim 55** and need not be reiterated.

59. **Claims 38, 39** (i.e. “the analyte extraction chamber is operative to perform dynamic field gradient focusing” and “the analyte extraction chamber is operative to perform electric field gradient focusing”) are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

60. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Tiffany Fetzner** whose telephone number is **(703) 305-0430**. The examiner can normally be reached on Monday-Thursday from 7:00am to 4:30pm., and on alternate Friday's from 7:00am to 3:30pm.

61. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Edward Lefkowitz**, can be reached on **(703) 305-4816**. The fax phone number for the organization where this application or proceeding is assigned is (703)305-3432 .

62. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0956.

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TAF *Tiffany A. Feigner*

March 24, 2003

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